**Lost and Found**

**Documentation of Codes for creating different visualizations  
in following programs: Neo4j, R**

**Neo4j Code:**

LOAD CSV WITH HEADERS

FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

CREATE (a:Artwork {artwork\_id: toInteger(row.Artwork\_id), title: row.Title, artist: row.Artist, year: row.Year, culture: row.Culture});

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

MERGE (c:Collector {collector\_id: toInteger(row.Collector\_id), collector\_name: row.Hungarian\_collection})

MERGE (a:Artwork {artwork\_id: toInteger(row.Artwork\_id)})

MERGE (c)-[owned:OWNED] (a)

SET owned.year = toInteger(row.Original\_date);

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

MERGE (o2:Owner\_2 {owner2\_name: row.Owner\_2})

MERGE (a:Artwork {artwork\_id: toInteger(row.Artwork\_id)})

ON CREATE SET

o2.owner2\_name = row.Owner\_2,

a.title = row.Title,

a.artist = row.Artist

MERGE (a)-[transfer1:TRANSFERRED\_TO] (o2)

ON CREATE SET

transfer1.year = toInteger(row.Date\_2),

transfer1.location = row.Location\_2

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

WHERE row.Owner\_3 IS NOT NULL

MERGE (o3:Owner\_3 {owner3\_name: row.Owner\_3})

MERGE (o2:Owner\_2 {owner2\_name: row.Owner\_2})

ON CREATE SET

o3.owner3\_name = row.Owner\_3,

o2.owner2\_name = row.Owner\_2

MERGE (o2)-[transfer2: SHIFTED] (o3)

ON CREATE SET

transfer2.year = toInteger(row.Date\_3),

transfer2.location = row.Location\_3

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

WHERE row.Owner\_4 IS NOT NULL

MERGE (o4:Owner\_4 {owner4\_name: row.Owner\_4})

MERGE (o3:Owner\_3 {owner3\_name: row.Owner\_3})

ON CREATE SET

o4.owner4\_name = row.Owner\_4,

o3.owner3\_name = row.Owner\_3

MERGE (o3)-[transfer3: RELOCATED\_TO] (o4)

ON CREATE SET

transfer3.year = toInteger(row.Date\_4),

transfer3.location = row.Location\_4

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

WHERE row.Owner\_5 IS NOT NULL

MERGE (o5:Owner\_5 {owner5\_name: row.Owner\_5})

MERGE (o4:Owner\_4 {owner4\_name: row.Owner\_4})

ON CREATE SET

o5.owner5\_name = row.Owner\_5,

o4.owner4\_name = row.Owner\_4

MERGE (o4)-[transfer4: MOVED\_TO]->(o5)

ON CREATE SET

transfer4.year = toInteger(row.Date\_5),

transfer4.location = row.Location\_5

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

WHERE row.Owner\_6 IS NOT NULL

MERGE (o6:Owner\_6 {owner6\_name: row.Owner\_6})

MERGE (o5:Owner\_5 {owner4\_name: row.Owner\_5})

ON CREATE SET

o6.owner6\_name = row.Owner\_6,

o5.owner5\_name = row.Owner\_5

MERGE (o5)-[transfer5:TRANSFERRED\_TO] (o6)

ON CREATE SET

transfer5.year = toInteger(row.Date\_6),

transfer5.location = row.Location\_6

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

WHERE row.Owner\_7 IS NOT NULL

MERGE (o7:Owner\_7 {owner7\_name: row.Owner\_7})

MERGE (o6:Owner\_6 {owner6\_name: row.Owner\_6})

ON CREATE SET

o7.owner7\_name = row.Owner\_7,

o6.owner6\_name = row.Owner\_6

MERGE (o6)-[transfer6:SHIFTED] (o7)

ON CREATE SET

transfer6.year = toInteger(row.Date\_7),

transfer6.location = row.Location\_7

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

WHERE row.Owner\_8 IS NOT NULL

MERGE (o8:Owner\_8 {owner8\_name: row.Owner\_8})

MERGE (o7:Owner\_7 {owner7\_name: row.Owner\_7})

ON CREATE SET

o8.owner8\_name = row.Owner\_8,

o7.owner7\_name = row.Owner\_7

MERGE (o7)-[transfer7:RELOCATED\_TO] (o8)

ON CREATE SET

transfer7.year = toInteger(row.Date\_8),

transfer7.location = row.Location\_8

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

WHERE row.Owner\_9 IS NOT NULL

MERGE (o9:Owner\_9 {owner9\_name: row.Owner\_9})

MERGE (o8:Owner\_8 {owner8\_name: row.Owner\_8})

ON CREATE SET

o9.owner9\_name = row.Owner\_9,

o8.owner8\_name = row.Owner\_8

MERGE (o8)-[transfer8:MOVED\_TO] (o9)

ON CREATE SET

transfer8.year = toInteger(row.Date\_9),

transfer8.location = row.Location\_9

LOAD CSV WITH HEADERS FROM "http://localhost:11001/project-795f3f56-54ef-4f91-99df-bf2a954ade02/DSP\_final.csv" AS row

WITH row

WHERE row.Owner\_10 IS NOT NULL

MERGE (o10:Owner\_10 {owner10\_name: row.Owner\_10})

MERGE (o9:Owner\_9 {owner9\_name: row.Owner\_9})

ON CREATE SET

o10.owner10\_name = row.Owner\_10,

o9.owner9\_name = row.Owner\_9

MERGE (o9)-[transfer9:TRANSFERRED\_TO] (o10)

ON CREATE SET

transfer9.year = toInteger(row.Date\_10),

transfer9.location = row.Location\_10

**R – Visualization of the artworks and their owners.**

library(readr)

library(dplyr)

library(tidyverse)

library(ggplot2)

df = Lost\_artworks <- read\_csv("/Users/rebekaerdo/Documents/Digital Humanities/2023 Winter/Data Structures and Management/Final Project/Lost\_artworks.csv")

View(df)

location = table(df$Location)

df\_location = as.data.frame(location)

colnames(df\_location) = c("Country", "Artworks")

ss\_location = subset(df\_location, Artworks > 2)

ggplot(ss\_location, aes(x=reorder(Country, -Artworks), y = Artworks)) +

geom\_bar(stat="identity",color="grey", fill= "grey") +

ggtitle("Location") +

theme(plot.title = element\_text(hjust = 0.5))

culture = table(df$Culture)

culture

df\_culture = as.data.frame(culture)

colnames(df\_culture) = c("Origin", "Artworks")

ggplot(df\_culture, aes(x=reorder(Origin, -Artworks), y = Artworks)) +

geom\_bar(stat="identity",color="lightblue", fill= "lightblue") +

scale\_y\_continuous(breaks=c(5,10,15,20,25,30,35,40,45,50,55,60,65,70)) +

ggtitle("Artworks by Origin") +

theme(plot.title = element\_text(hjust = 0.5))

collector = table(df$Hungarian\_collection)

df\_collector = as.data.frame(collector)

colnames(df\_collector) = c("Name", "Artworks")

ggplot(df\_collector, aes(x="", y = Artworks, fill=Name)) +

geom\_bar(stat="identity",width =1, color="white") +

geom\_text(aes(label = after\_stat(y)),

position = position\_stack(vjust = 0.5)) +

coord\_polar(theta="y") +

scale\_fill\_brewer(palette="Pastel1") +

theme\_void() +

ggtitle("Artworks by Collections") +

theme(plot.title = element\_text(hjust = 0.5))

df1 = subset(df, df$Current\_location == "Lost")

table = table(df1$Hungarian\_collection)

df\_table = as.data.frame(table)

colnames(df\_table) = c("Collector", "Artworks")

ggplot(df\_table, aes(x=Collector, y = Artworks)) +

geom\_bar(stat="identity",color="darkblue", fill= "darkblue") +

scale\_y\_continuous(breaks=c(0,2,4,6,8,10,12)) +

ggtitle("Lost Artworks by Collectors") +

theme(plot.title = element\_text(hjust = 0.5))

barplot(table,

xlab = "The hungarian collectors",

ylab = "The number of lost artworks",

ylim = c(0,12),

main = "Lost artworks by all collectors",

col = "darkblue")

Owners = c("Lost", "Private", "Museums")

Artworks = c(29, 31, 99)

df\_owner = data.frame(Owners, Artworks)

ggplot(df\_owner, aes(x=Owners, y=Artworks)) +

geom\_bar(stat = "identity", color="blue", fill= "blue") +

ggtitle("Current Location of the Artworks") +

theme(plot.title = element\_text(hjust = 0.5))